

## **AW-3: Reconfigure Airports Efficiently**

### **Timely planning and coordination of configuration changes during changing weather conditions**

#### **Milestones/Key Dates**

In-Service Decision: September 2002

#### **Background**

Significant changes in wind direction over airport runways, or the onset/end of hazardous weather in the airport environment, often require changes to the airport departure and arrival configurations. Weather changes can result in a major disruption of traffic flow if knowledge of required changes is not known in advance. With this understanding, the FAA is deploying systems that will assist users to make better informed decisions to minimize disruption to traffic flow while maintaining the safety of the system.

#### **Operational Change Description**

Accurate information regarding the location and severity of hazardous weather enables optimal use of unimpacted airspace, which yields greater operational efficiency and maximum capacity. Improved weather predictions and observations will allow traffic flow reconfiguration to be proactively planned and coordinated between traffic management personnel in the TRACON, ARTCC, and ATCSCC and dispatchers in AOCs. The result will be a much smoother reconfiguration, optimization of traffic flow, and less congestion at the airport. There are two areas of operational impact addressed below:

AW-3.1: Improved configuration coordination with facilities and carriers.

AW-3.2: Improved procedures for adjacent airport coordination.

#### **Benefit, Performance, Metrics**

ITWS provides information to facilitate matching of arrival and departure restrictions to forecasted weather. Traffic flow patterns of inbound and outbound aircraft can be optimized; upstream holding patterns are reduced; congestion on the ground is reduced; and, gate holds and stops are reduced, freeing gates for inbound traffic.

Studies completed at the NYC area airports in 2001 show that on high vertical wind shear days, the AAR is raised by 3 aircraft per hour, per airport, during the event. During convective weather events it was found that 10% more flights departed as a result of ITWS information and arrivals increased by 4 per hour over a two-hour event.

Operational data from ITWS prototypes deployed at major airports have been collected and analyzed on an on-going basis since 1994. It is well documented that ITWS makes a major contribution toward improved airport efficiency by reducing delays during adverse weather. The data show that when ITWS is fully deployed, delay reductions per year are expected to be on the order of 12,000,000 minutes. This translates to approximately \$188M per year in reduced airline operating costs. Total annual economic benefit is estimated at \$625M per year when savings in passenger time are included.

## **AW-3.1 Configuration Coordination with Facilities and Carriers**

### **Scope and Applicability**

Currently, EWR, LGA, JFK, DFW, MEM, MCO are using pre-production prototype ITWS systems for increased capacity in all weather conditions. FAA developed systems have been installed for Operational Testing at the Kansas City and Houston airports. By December 2003 it is planned to have fielded 34 ITWS sites covering 47 airports. ITWS sites are high traffic airports, particularly those in regions where thunderstorms occur frequently.

ITWS will provide accurate current and predicted graphical depictions of the location and movement of terminal weather that will impact airport acceptance rates. TMU specialists, supervisors, and dispatchers will be able to anticipate rather than just react to hazardous weather, and will be able to coordinate the movement of traffic through alternate arrival/departure routes, resulting in overall increases in capacity.

Initial deployment of ITWS will integrate the information from weather sensors (TDWR, NEXRAD, LLWAS, ASR-9) in the airport terminal environment. ITWS will provide runway specific warnings up to 2 minutes prior to occurrence of a hazardous microburst. ITWS will significantly improve the determination of gust front location and intensity and the forecasts (10- and 20-minutes) of future gust front positions. ITWS will provide products indicating the location, extent, and intensity of precipitation, along with the current and 10- and 20-minute extrapolated position, extent, speed, and direction of individual storms. The implementation of these products is expected to improve the anticipation of wind shear impacts through the shared situational awareness available to flight crews and air traffic planners, enable potentially impacted airports to implement safe alternative traffic patterns and achieve higher levels of capacity throughout the impact period. ITWS products will also be provided to External Users through Volpe and intranet access, including Airlines, ATCSCC, NWS, Airport/Port Authorities, and others.

There are no anticipated formal changes to operational rules and procedures. However there will be an overall improvement in coordination and ATC efficiency as the ITWS provides a single, reliable source of significant real-time weather information to users.

ITWS is planned as an evolutionary system. Future enhancements under P3I include the Terminal Convective Weather Forecast product (TCWF), which will provide a 30- and 60-minute forecast of storm motion, a Terminal Winds Graphical product, Lightning Data display, and interfaces to automation systems, such as STARS and ACE-IDS.

The ITWS program has always planned to upgrade the hardware platform when moving from the First Article to production systems. The upgraded hardware is necessary to allow ITWS to stay current with planned improvements and technology advances.

### **Key Decisions**

- The Product team has held fact-finding discussions with the contractor and determined the best solution was a more current hardware platform, which can be accommodated within the current program baseline. The product team, contractor, and senior ATS membership met to discuss the acquisition approach. It was determined the current strategy will meet the program baseline dates with a phased approach for the upgraded hardware changes.
- Need to obtain agreement from both internal and external (e.g., airlines, NWS) users that existing procedures for airport reconfiguration are sufficient to accommodate planned ITWS deployment.

### **Key Risks**

- Maintaining the baseline schedule will be dependent on agreement from FAA unions, especially PASS, on the phased approach to implementing the hardware changes, certification tool, and AF training.

## **AW-3.2 Procedures for Adjacent Airport Coordination**

### **Scope and Applicability**

ITWS operations at NY airports (EWR, LGA, and JFK) are addressing adjacent airport coordination. Several other ITWS production sites will also include multiple airport environments.

- Procedures and coordination already in use, including multiple airport sites, will be enhanced by the timelier and more accurate information provided by these systems, providing users better decision-making tools.
- Promote among decision makers common situational awareness of weather scenarios affecting traffic routes and potential reconfigurations.

### **Key Risks**

- Provision of new capabilities might occasionally require some procedural changes.